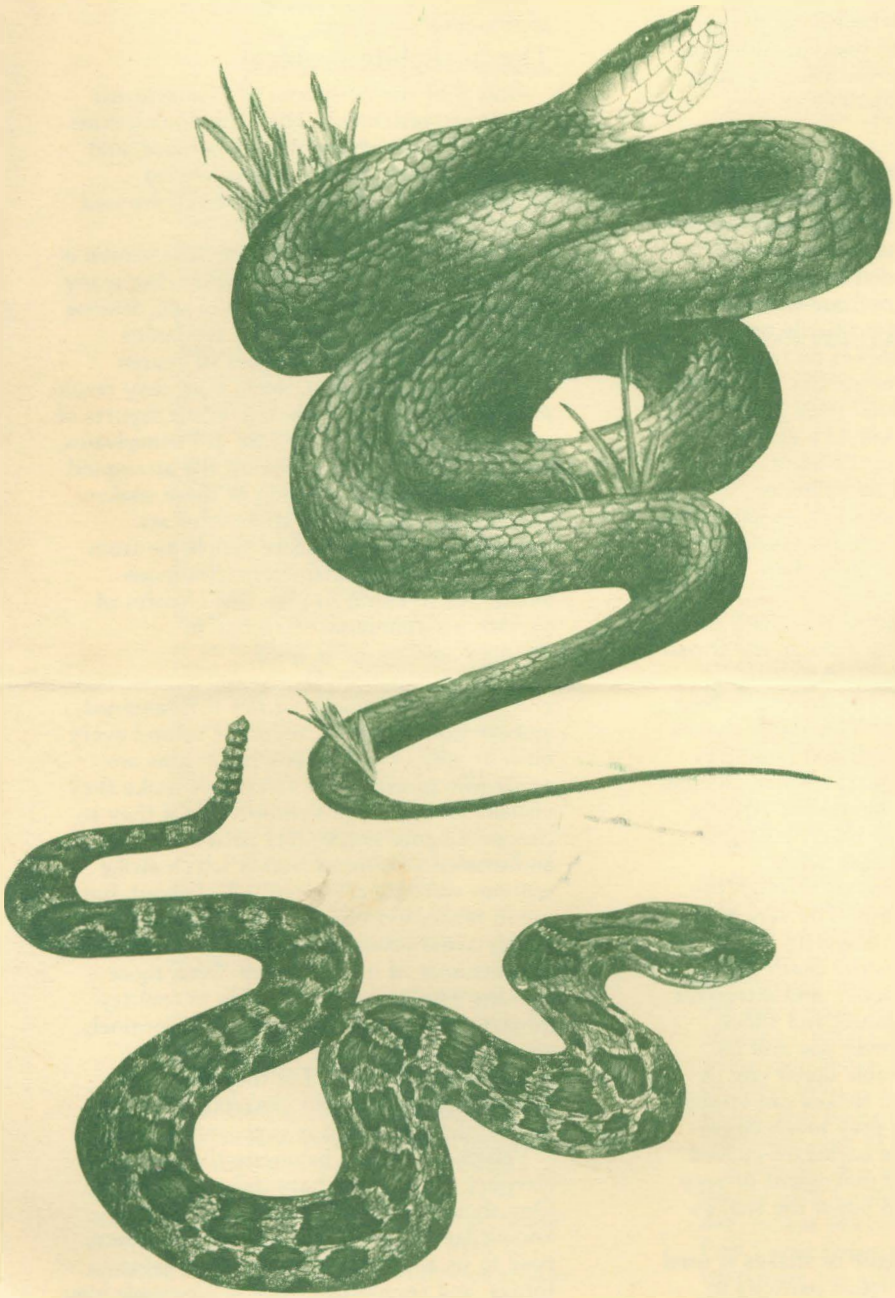
SNAKES in PENNSYLVANIA

by Clark N. Shiffer

Herpetology and Endangered Species Coordinator



Illustrations by Tom Duran and Ted Walke

Characteristics

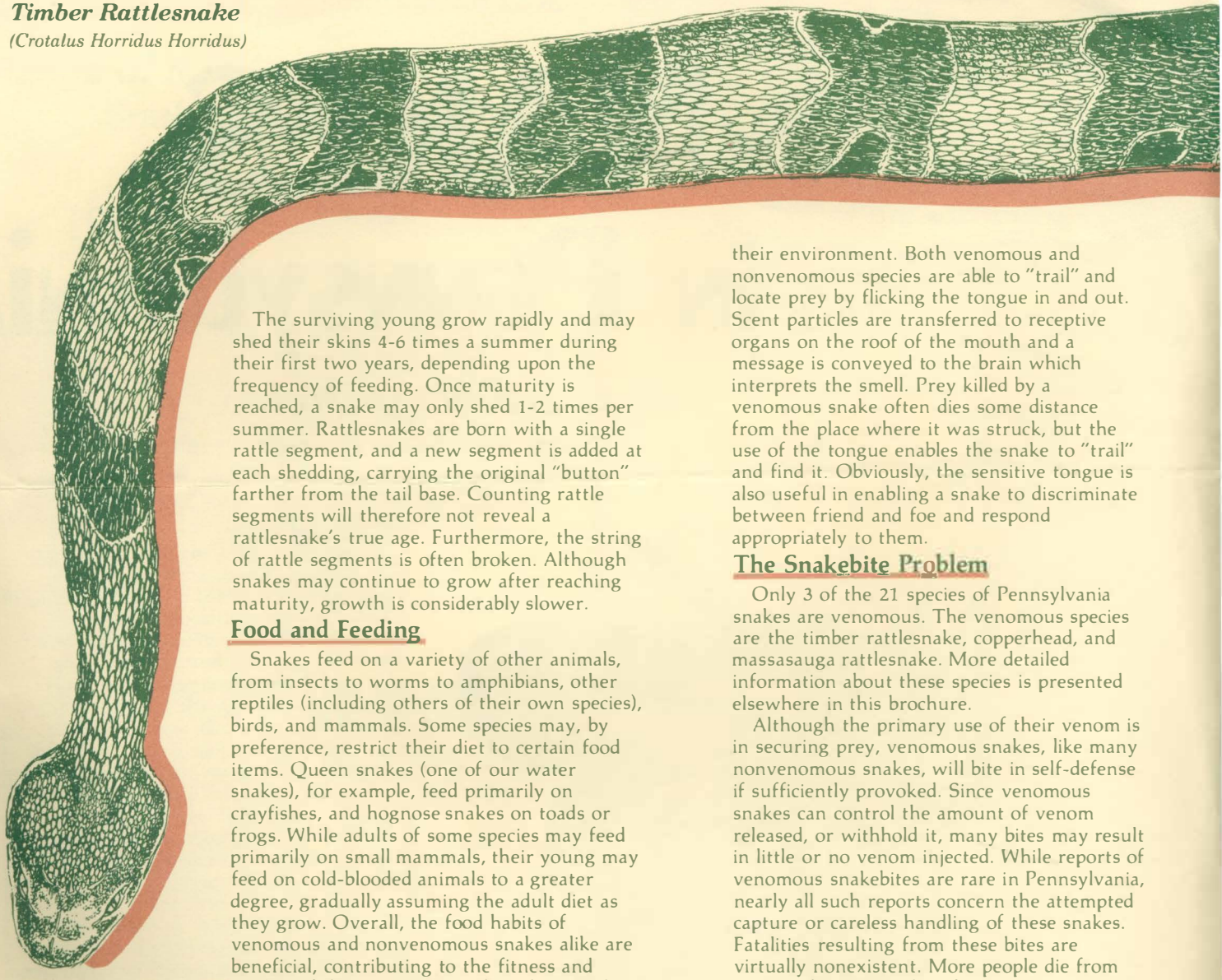
Snakes, like turtles and lizards, belong to that group of animals known as reptiles, which are characterized by a body covering of scales. They are cold-blooded animals, sensitive to the temperature around them, dependent upon the heating and cooling effects of their environment for control of body temperature. Unable to withstand extremes of hot or cold, snakes will seek cooler spots to rest during hot days, and in winter hibernate below the frost line, utilizing crevices in rocks, holes under stumps, and animal burrows. Various species may hibernate in large groups of the same or different species. Immediately following hibernation in early spring, snakes seek open, sunny sites to bask, or sunbathe, and females carrying developing eggs or embryos are particularly likely to continue basking during the morning hours as the season progresses. Snakes also bask during the fall months prior to entering hibernation.

Reproduction and Growth

Mating may occur anytime from spring to fall. Some species of snakes lay eggs, while others, including the garter snakes, water snakes, and our three venomous species, give birth to live young. In most cases, the young hatch or are live-born in late summer. Female snakes mating in mid-late summer thus carry the developing eggs or embryos through hibernation and the following spring or summer months before the warmth obtained during basking brings them to full development 8-12 months later. Some species bearing live young, our venomous species in particular, may not reach breeding readiness for 3-7 years after birth, and may only bear young at 2-3 year intervals thereafter.

Depending upon the species, the number of eggs or live young may vary from 1 to 100, but is usually less than 24. Females of some species may stay with their egg clutch until hatching, but most do not, and hatchlings or live-born young are left to fend for themselves. Venomous species possess venom at birth for securing prey. Many young snakes, however, die before reaching adulthood.

Timber Rattlesnake
(Crotalus Horridus Horridus)



The surviving young grow rapidly and may shed their skins 4-6 times a summer during their first two years, depending upon the frequency of feeding. Once maturity is reached, a snake may only shed 1-2 times per summer. Rattlesnakes are born with a single rattle segment, and a new segment is added at each shedding, carrying the original "button" farther from the tail base. Counting rattle segments will therefore not reveal a rattlesnake's true age. Furthermore, the string of rattle segments is often broken. Although snakes may continue to grow after reaching maturity, growth is considerably slower.

Food and Feeding

Snakes feed on a variety of other animals, from insects to worms to amphibians, other reptiles (including others of their own species), birds, and mammals. Some species may, by preference, restrict their diet to certain food items. Queen snakes (one of our water snakes), for example, feed primarily on crayfishes, and hognose snakes on toads or frogs. While adults of some species may feed primarily on small mammals, their young may feed on cold-blooded animals to a greater degree, gradually assuming the adult diet as they grow. Overall, the food habits of venomous and nonvenomous snakes alike are beneficial, contributing to the fitness and vitality of the environment they share with man and other living things.

Nonvenomous snakes grasp prey with the mouth, holding and moving it down the throat with the aid of rows of sharp, backward-curved teeth. Prey may be constricted or held down by loops of the body. Venomous snakes also possess these same teeth and facial pits for detecting the heat of nearby warm-blooded prey. They kill their prey by quickly striking and puncturing it with two sharp, enlarged and hollow front teeth (fangs), while simultaneously injecting venom through the fangs and into the punctures. The venom, a modified saliva containing powerful digestive enzymes, ultimately causes the death of the prey due to cellular destruction and attendant hemorrhaging, fluid imbalance, and shock.

Since each half of the lower jaw and its connections to the immovable upper jaw is joined by elastic ligaments, snakes can stretch the mouth gradually over prey much larger than their own heads. The backward-curved teeth prevent the forward movement of prey and direct it backward and down the snake's throat.

The flexible, forked tongue of snakes is used primarily to sample scent-laden particles in their environment. Both venomous and nonvenomous species are able to "trail" and locate prey by flicking the tongue in and out. Scent particles are transferred to receptive organs on the roof of the mouth and a message is conveyed to the brain which interprets the smell. Prey killed by a venomous snake often dies some distance from the place where it was struck, but the use of the tongue enables the snake to "trail" and find it. Obviously, the sensitive tongue is also useful in enabling a snake to discriminate between friend and foe and respond appropriately to them.

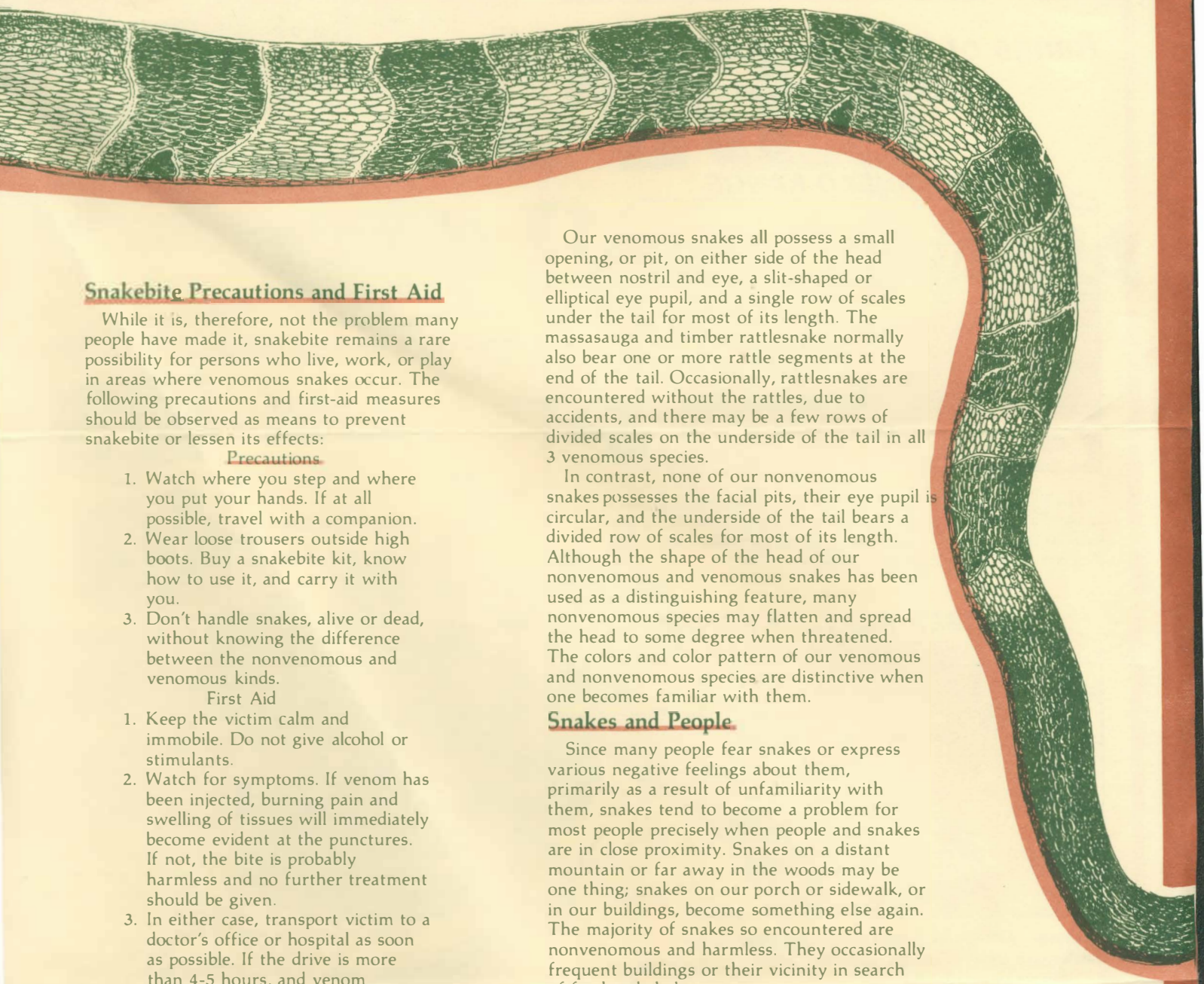
The Snakebite Problem

Only 3 of the 21 species of Pennsylvania snakes are venomous. The venomous species are the timber rattlesnake, copperhead, and massasauga rattlesnake. More detailed information about these species is presented elsewhere in this brochure.

Although the primary use of their venom is in securing prey, venomous snakes, like many nonvenomous snakes, will bite in self-defense if sufficiently provoked. Since venomous snakes can control the amount of venom released, or withhold it, many bites may result in little or no venom injected. While reports of venomous snakebites are rare in Pennsylvania, nearly all such reports concern the attempted capture or careless handling of these snakes. Fatalities resulting from these bites are virtually nonexistent. More people die from wasp or bee stings than from venomous snakebites in Pennsylvania. The chances of surviving a venomous snakebite in Pennsylvania are quite good.

Our venomous snakes are not aggressive, preferring to lie quietly or flee if threatened, and are not found on, under, or behind every bush or rock. The majority of persons are easily able to avoid any venomous snake they visually encounter in Pennsylvania if they so choose. Chance encounters between people and unseen venomous snakes which strike without warning are often talked about, but are in reality extremely rare. Most people simply avoid venomous snakes as a result of circumstance, if not by choice. Even those persons who live, work, or play in country inhabited by our venomous snakes routinely encounter far fewer of them than many people might imagine. For these and most other people, venomous snakebite is not, in reality, the problem it is supposed to be.

Venomous snakes belong to the same category of outdoor "hazards" as poison ivy. One should be able to identify them, be knowledgeable about the actual threat they pose to us and their value to other living things, and respond to them in a sensible way.



Snakebite Precautions and First Aid

While it is, therefore, not the problem many people have made it, snakebite remains a rare possibility for persons who live, work, or play in areas where venomous snakes occur. The following precautions and first-aid measures should be observed as means to prevent snakebite or lessen its effects:

Precautions

1. Watch where you step and where you put your hands. If at all possible, travel with a companion.
2. Wear loose trousers outside high boots. Buy a snakebite kit, know how to use it, and carry it with you.
3. Don't handle snakes, alive or dead, without knowing the difference between the nonvenomous and venomous kinds.

First Aid

1. Keep the victim calm and immobile. Do not give alcohol or stimulants.
2. Watch for symptoms. If venom has been injected, burning pain and swelling of tissues will immediately become evident at the punctures. If not, the bite is probably harmless and no further treatment should be given.
3. In either case, transport victim to a doctor's office or hospital as soon as possible. If the drive is more than 4-5 hours, and venom reaction is mild to moderate, a 3/4" or wider *constriction band* should be applied several inches above the bite, *and left in place.* It should only be tight enough to *slow* the surface flow of blood and lymph. The "cut and suction" method should not be used unless medical assistance is delayed for more than 4-5 hours and *severe* venom reaction is evident.
4. The only effective treatment for snakebite is antivenin therapy, which must be given under medical supervision.

Venomous?...or Nonvenomous?

There are several physical characteristics that can be used to separate the 3 species of venomous snakes from the 18 species of nonvenomous snakes in Pennsylvania. Some of these characteristics cannot be used to separate venomous and nonvenomous snakes in certain parts of the United States.

Our venomous snakes all possess a small opening, or pit, on either side of the head between nostril and eye, a slit-shaped or elliptical eye pupil, and a single row of scales under the tail for most of its length. The massasauga and timber rattlesnake normally also bear one or more rattle segments at the end of the tail. Occasionally, rattlesnakes are encountered without the rattles, due to accidents, and there may be a few rows of divided scales on the underside of the tail in all 3 venomous species.

In contrast, none of our nonvenomous snakes possesses the facial pits, their eye pupil is circular, and the underside of the tail bears a divided row of scales for most of its length. Although the shape of the head of our nonvenomous and venomous snakes has been used as a distinguishing feature, many nonvenomous species may flatten and spread the head to some degree when threatened. The colors and color pattern of our venomous and nonvenomous species are distinctive when one becomes familiar with them.

Snakes and People

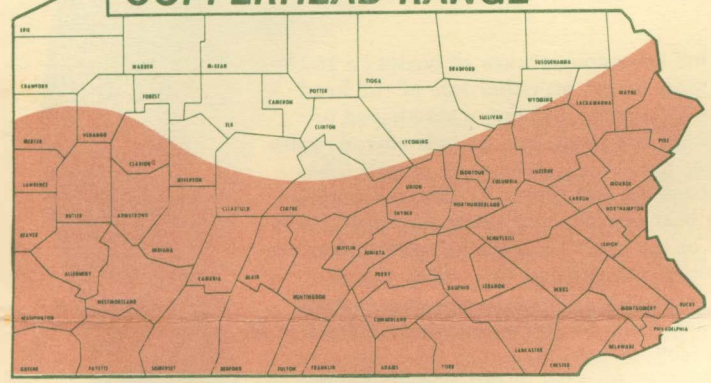
Since many people fear snakes or express various negative feelings about them, primarily as a result of unfamiliarity with them, snakes tend to become a problem for most people precisely when people and snakes are in close proximity. Snakes on a distant mountain or far away in the woods may be one thing; snakes on our porch or sidewalk, or in our buildings, become something else again. The majority of snakes so encountered are nonvenomous and harmless. They occasionally frequent buildings or their vicinity in search of food and shelter.

Sealing access to buildings, removing shelter around them, and eliminating rodents, will discourage the larger species of snakes particularly. Snakes of any size, particularly smaller species, are not frequently found around buildings, since their food and shelter requirements are adequately met elsewhere. Since only a few snakes of any species are seen in or around buildings, these can be removed as they are encountered. It might be emphasized that these occasional individuals are most often found *outside,* rather than inside buildings, where they are more accessible. In those rare instances when snakes become a problem in inaccessible portions of buildings, fumigation by professional pest control operators may be needed.

Although it is legal to catch, take, or kill two of each kind of Pennsylvania snakes per day, except the endangered massasauga, the Fish Commission does not condone or encourage the senseless and needless killing of snakes.

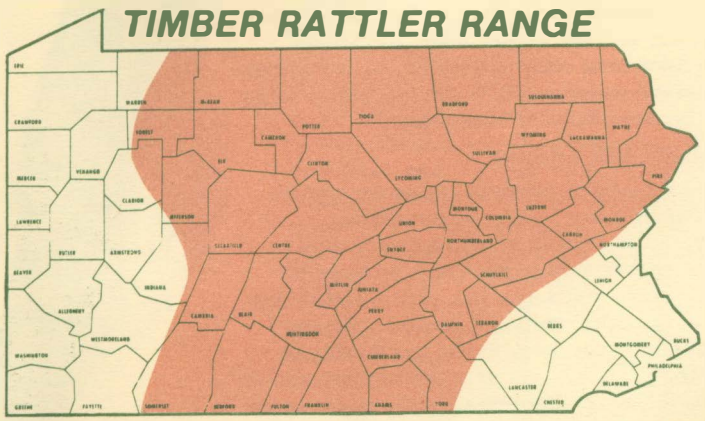
Range of the Venomous Snakes of Pennsylvania

COPPERHEAD RANGE



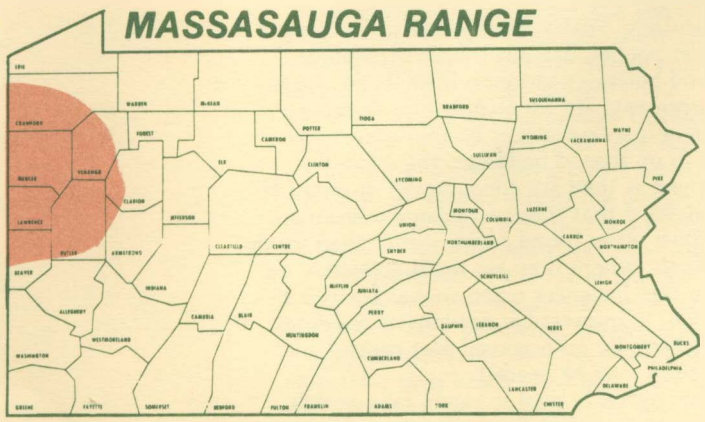
The Copperhead is Pennsylvania's most common poisonous snake. Found primarily in the southern two-thirds of the State, its favorite haunts are abandoned foundations and rock walls. Will sometimes den with rattlesnakes.

TIMBER RATTLER RANGE



Largest of the three poisonous snakes, the Timber Rattlesnake inhabits the mountainous regions of the State. Rattlesnake populations are feeling the pressure of increased recreational use of the mountain terrain.

MASSASAUGA RANGE



Preferring marshy areas, the Massasauga is found only in several counties in the western part of the State. Shy creatures; rarely found in the open. Draining of wetlands has destroyed many populations of the "Swamp Rattler."

FIG. 1

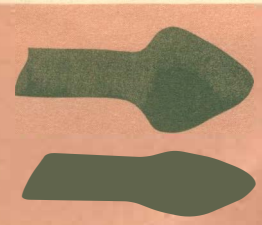


FIG. 2

FIG. 3

VENOMOUS
Vertical "Slit" Pupil

NON-VENOMOUS
Round Pupil

FIG. 4

Figure 1. The venomous snakes common to this State have a head that is flattened in appearance, flaring outward from the nostril to the rear portion of the head. Triangular in shape, the head of the venomous snake thus contrasts with the tubular shape of the nonvenomous varieties.

Figure 2. Belonging to the pit viper family, each of the venomous snakes have a small opening or "pit" in the side of the head between the eye and the nostril. Non-venomous snakes do not have this heat-sensing faculty.

Figure 3. Look a snake square in the eye. The eye of Pennsylvania's venomous snakes have an elliptical pupil; the pupil of the non-venomous species is completely round.

Figure 4. Check the underside of the tail. Venomous snakes have single, undivided scales, while the harmless species have a double row of scales on the underside.

SPORTSMEN, EDUCATORS...

The Fish Commission now has available four separate charts showing Pennsylvania reptiles and amphibians: Snakes of Pennsylvania; Frogs of Pennsylvania; Turtles of Pennsylvania; and, Salamanders of Pennsylvania. Each species is identified with its common and scientific name; adult sizes are given. Each chart measures 17 x 22 inches and is printed in full color. Send for one or all four. Cost by mail is 50 cents each, plus one dollar for postage and handling. Make check or M.O. payable to the Pennsylvania Fish Commission and mail to:

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